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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,512	06/21/2005	Daniel Alvarez Jr	3194.1025-009	9101

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EXAMINER
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LAWRENCE JR, FRANK M

ART UNIT	PAPER NUMBER
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1724

MAIL DATE	DELIVERY MODE
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07/16/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/531,512

**Applicant(s)**

ALVAREZ JR ET AL.

**Examiner**

Frank M. Lawrence

**Art Unit**

1724

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                 | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities: In line 21 of page 2, "canleach" should be changed to "can leach".

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 is indefinite because it has an "original" claim identifier but omits the step of exposing to an oxidizing agent from the original claim 9.

4. Claim 12 recites the limitation "the oxidizing agent" in line 1. There is insufficient antecedent basis for this limitation in the claim. This rejection can be overcome by adding the omitted step to claim 9 as discussed in paragraph 3 above. Claims 10, 11 and 13-16 are rejected for depending from a rejected parent claim.

### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 and 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by the European Patent Application (EP 0698577 A1).

7. EP '577 teaches a process for removing contaminants from carbon dioxide, comprising contacting with a mixed copper-zinc oxide (see col. 4, lines 14-45, claim 1).

8. Claims 1 and 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by the European Patent Application (EP 0952111 A1).

9. EP '111 teaches a process for removing contaminants from carbon dioxide, comprising contacting with a mixed metal oxide including zinc or copper oxides (see paragraph 30).

10. Claims 1-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Prasad et al. (6,537,514).

11. Prasad et al. '514 teach a process for decreasing the oxygen content of a carbon dioxide stream to zero, comprising contacting the stream with a mixed metal oxide ion transport membrane. The metals can include combinations of Co, La, Bi, Sr and Ce oxides (see col. 7, line 13 to col. 8, line 64, col. 19, lines 15-33).

12. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Ruettinger et al. (2002/0041842 A1).

13. Ruettinger et al. '842 teach a process for removing hydrogen sulfide from a carbon dioxide containing stream, comprising contacting the stream with a mixed metal oxide including Cu, Ni, Fe, or Mn oxides to reduce the hydrogen sulfide content to less than 20 ppb (see paragraphs 12, 30, 49, 51, claims 1, 3).

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14. Claims 1 and 5-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Khare (5,244,641).

15. Khare '641 teaches a process for removing hydrogen sulfide from a carbon dioxide stream, comprising contacting the stream with a mixed oxide of iron, zinc and nickel, purging the oxide with an inert gas, and regenerating by heating in the presence of free oxygen, cooling, and purging with inert gas (see col. 2, lines 1-41, col. 4, line 22 to col. 5, line 40, claims 1, 12, 13).

16. Claims 9, 10, 12-14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang (5,186,727).

17. Chang '727 teaches a process for regeneration of a spent mixed metal oxide adsorbent, comprising contacting with air at 200-300° C, followed by cooling to room temperature in humid air (col. 3, lines 24-42). The cooling air will inherently contain hydrogen and nitrogen, and the claimed second temperature will be reached during cooling to room temperature.

***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chang '727.

20. Chang '727 discloses all of the limitations of the claims except that the first temperature is about 400° C. Absent a showing of criticality or unexpected results, the regeneration temperature is considered to be a parameter that would have been routinely optimized by one

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having ordinary skill in the art at the time of the invention in order to achieve the most complete adsorbent regeneration without physically damaging the material.

***Allowable Subject Matter***

21. Claim 15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

22. Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional references listed on the attached PTO-892 form disclose carbon dioxide purification methods.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank M. Lawrence whose telephone number is 571-272-1161. The examiner can normally be reached on Mon-Thurs 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Frank M. Lawrence  
Primary Examiner  
Art Unit 1724

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*Paul Hur*  
6-20-07